

- Var. *pindarina* Ducl., in Chenu's Ill. Conch., ii, pl. 12, f. 10, pl. 17, f. 7, 8.
punctulata Marr. Thes. Conch., iv, pl. 2, f. 12, 13.
harpularia (Lam.) Reeve, Conch. Icon., pl. 14, f. 28 (decorticated).
 Var. *venulata* Lam. Ann. du Mus., xvi, 313, 1810.
reticularis Reeve (pars) Conch. Icon., vi, pl. 10, f. 16 b.
obesina Reeve (pars) Conch. Icon., vi, pl. 10, f. 16 c.
mariae Ducros, Rev. crit., p. 50, pl. 2, f. 26.
 Var. *graphica* Marr., Thes. Conch., iv, pl. 3, f. 36.
porcea Marr., Thes. Conch., iv, pl. 3, f. 35.
oblonga Marr., Thes. Conch., iv, pl. 2, f. 14.
 Var. *violacea* Marr., Thes. Conch., iv, pl. 4, f. 56.
 Var. *ustulata* Lam., Anim. sans vert., v, 620, 1822.
oriola Ducl. (not Lam.), in Chenu's Ill. Conch., ii, pl. 11, f. 1, 2.
fuscata Marr., Thes. Conch., iv, pl. 2, f. 20-22.
brunnea Marr., Thes. Conch., iv, pl. 4, f. 54, 55.
 Var. *polpasta* Ducl. in Chenu's Ill. Conch., Pl. 17, f. 1, 2.
 Var. *cumingi* Reeve, Conch. Icon., vi, pl. xi, f. 19.
ligneola Reeve (pars) Conch. Icon., vi, pl. 21, f. 57 a b (juv.)

Bolten and Lamareck again refer to the same figure by Martini (Conch. Cab., ii, tab. 48, f. 509). Bolten refers to it a second time as his type of *arachnoidea*, while the figure he refers to as the type of his *litterata* (Conch. Cab., ii, tab. 46, f. 488) is not sufficiently characterized for varietal distinction. The above varieties were briefly diagnosed in my previous paper (NAUTILUS, xxiv, p. 122, 1911).

ON CLASSIFICATION IN GENERAL AND THE GENUS
 LYMNAEA IN PARTICULAR.

BY HAROLD SELLERS COLTON.

The value of the generic name is the subject of this paper. To illustrate this, the genus *Lymnaea* is considered.

The most recent classification of this group is that of F. C.

Baker in his admirable "Lymnaeidae of North and Middle America" (Chicago Academy of Sciences Pub. No. 3, 1911) p. 120. Whereas the older classifications considered shell characters alone, this author "proposed to classify the Lymnaeids by the characters of the shell, genitalia (shape of prostate, relative size and form of the penis and penis-sac) and radula."

On a basis of these criteria he has split the genus *Lymnaea* as defined by Haldeman 1840, Gould, Binney 1868, Dall 1871, Tryon 1872 & 1884 and more recently by Dall in 1905, into six genera:—*Lymnaea*, *Pseudosuccinea*, *Radix*, *Bulimnaea*, *Acella* and *Galba*. He has done this mainly by raising a number of subgenera and sections of former authors to generic rank. I wish to ask this question: Is this at the present time justifiable? (1) Baker lists 103 species and varieties of the old *Lymnaea* in this work. Of but 33 have anything of the anatomy, radula and genital organs been studied. Therefore the shell characteristics are the important ones after all. (2) All these new genera are based largely on quantitative characters. The only qualitative character mentioned is the radula and this is given quite a subordinate place in the classification. (3) In his diagnosis of the genus *Galba* in his key he states that the "Penis (*epiphallus*) is shorter than the penis-sac" (Penis).¹

However, for two of the species of this genus the epiphallus is longer than the penis. See Baker p. 263 and 277.

In the mind of the writer our present knowledge will not allow us to make a comprehensive classification of the Lymnaeids based on the anatomy of the snail. We know too few species well. On the other hand the shell characters alone in a mollusk with such a generalized form of shell as have the Lymnaeids are not characters on which one can base much reliance.

On account of these reasons the writer would make the recommendation that the old genus *Lymnaea* should be retained in the sense that it has been used for the past seventy years. These

¹ I am indebted to Dr. H. A. Pilsbry for calling my attention to the fact that Baker has called the *epiphallus* the penis, and the true penis he has called the penis-sac. In this paper I will adhere to the general usage and refer to the epiphallus and penis instead of penis and penis-sac.

new genera of Baker will then become sub-genera. The sub-genera of Baker will be reduced to sections with one exception, viz., that of *Simpsonia*, now *Pseudogalba*, be retained as a sub-genus. This form seems to the writer, on account of the character of the radula, to be sufficiently different to cause its removal from the sub-genus *Galba*. We have then the following classification :—

Genus *Lymnæa* Lamareck.

Subgenus *Lymnæa* contains the *stagnalis* group.

Subgenus *Pseudosuccinea* contains the *columella* group.

Subgenus *Radix* contains *L. auricularia*.

Subgenus *Bulimnæa* contains *L. megasoma*.

Subgenus *Acella* contains *L. haldemani*.

Subgenus *Pseudogalba* (*Simpsonia*) contains the *humilis* and *obrussa*, *umbilicata* and *parva* groups.

Subgenus *Galba* contains the section *Galba*, and the *palustris*, *catascopium* and *emarginata* groups.

The classification recommended above has certain advantages over that proposed by Baker in that it indicates differences between groups of snails but does not commit one to place a shell the anatomy of whose animal is unknown in a given genus. It can be provisionally placed in a subgenus by superficial resemblance and if later changed will not affect the generic name. *It is by the generic name that animals are catalogued.* This is a very important practical matter and one that cannot be too much emphasized. To change generic names without an overwhelming amount of evidence in favor of the change is hindering instead of advancing the science. Species and minor groups on the other hand cannot be too much subdivided. It is an advance to describe every variation that can be distinguished. Of this work Bateson (Problems of Genetics, p. 249) says :—“They will serve science best by giving names freely and by describing everything to which their successors may possibly want to refer and generally by subdividing their material into as many species as they can induce any responsible society or journal to publish.” It must not be thought that the writer of this is trying in any way to slight the value of Baker’s work. It is a work of very great value and splendidly arranged. The clear statement of what we know of the group and what we do not know is most important. It is a model which many should follow. It has been the constant companion and guide of the writer for the past two years. He does not wish this paper to be considered a criticism but rather as an appendix to

that work, making it, if possible, still more valuable to students of American mollusks.

To recapitulate : generic names are those by which animals are catalogued, therefore should not be changed without overwhelming evidence in favor of the change. This value of the genera in cataloguing has not been sufficiently emphasized.

**A PROVISIONAL KEY TO THE SUBGENERA AND SPECIES
OF NORTH AMERICAN LYMNAEIDS.**

BY HAROLD S. COLTON.

The following is a preliminary key to some of the best known species in the genus *Lymnaea*. It is based on a careful study of the wealth of material in Baker's *Lymnaeidae* of North and Middle America. To this the writer has added a little that has come under his observation during the past eight years that he has been working with this group.

It must be noted that *L. auricularia* appears in two places in the key. This is because the radula of the Philadelphia form is different from the radula of the Chicago form.

It must be remembered also, as stated in the preceding article that the radula and character of the reproductive organs are the important characters in classification as the shell is such a generalized form. This being the case it will be of value in locating but 33 species and varieties as the other 73 have been described by shell characters alone. When they have been studied the key no doubt will have to be much modified.

The writer found it impossible to sub-divide the groups in his key. The species within a group are distinguished by shell characters alone, and although one familiar with species can distinguish them without much difficulty, it is almost impossible to state the differences in a few words.

This key is intended as a supplement to that of Baker p. 125. It makes no pretense of completeness. The writer, therefore, would be glad to hear of any practical difficulties arising in its application.

In the following key the ratio between the aperture length and the shell length is referred to as the "ratio."

GENUS LYMNAEA:—

Fresh-water pulmonate mollusks. Shell : normally dextral, rarely sinistral, ovately oblong to elongate. Animal : with a short, wide, rounded foot. Tentacles : flattened. Central tooth of the radula unicuspid ; laterals bi-or tri-cuspid. Male and female genital openings separate and on the right side. Mantle margins contained within the shell.